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Sequence Stratigraphic Features in the Gulf of Suez Rift and an Evaluation of their Controls

This work describes reservoir-scale features observed within well-exposed, footwall-derived, fan systems from the central, eastern margin of the Gulf of Suez rift. A tentative evaluation of the fundamental, controlling factors considered as responsible for the mapped, sequence stratigraphic elements was carried out by utilizing a forward, 3-D, numerical model of tectonics & sedimentation.

Significant differences in size and external form between the Hommur, Baba and Sidri fans were interpreted to be a result of discrepant amounts of sediment supplied by their respective drainage basins together with contrasting dimensions and geometries of each infilling fault block. Similar, overall stacking patterns and lithofacies distributions were identified in the three fan complexes. This observation is considered as an evidence for a common, syn-rift development of these fan bodies specifically regarding the rates of local subsidence and/or sediment supply. Syn-depositional episodes of fold growth seem to occur after the propagating, associated extensional fault has breached the surface as indicated by internal thinning and convergence of horizons along the dip direction towards the main fault scarp.

The quantitative modelling made use of spatially and temporally variable rates of sediment supply and fault-related subsidence plus low and high frequency fluctuations in the regional base level. The simulations demonstrated the major role played by these primary parameters in controlling the 3-D sequence architectures. Single results concerning individual effects upon the stratigraphy could not be reached mainly due to the large range of values associated with the controlling factors.